REMARKS

Upon entry of the foregoing amendment, claims 38-61 will remain pending in the application.

Support for the amendments made to the claims can be found in the specification as originally filed, including cancelled claims 1-37. The amendments to the claims presented herein have been made in a effort to more distinctly recite the inventive methods that the applicants regard as their own. In this respect, each of independent claims 38 and 50 recited a method for assisting the growth of a plant, which comprises the step of applying to the plant an effective amount of a plant-activating agent composition that comprises (a) a plant activation agent selected from a Markush grouping, and (b) a surfactant, which is also selected from a Markush grouping. Accordingly, entry of the instant amendment is respectfully requested.

Interview with Examiner

On June 15, 2004, the undersigned and Mr. Noboru Nomura of Kao Corporation held an interview with the Examiner of the above identified case (Examiner Clardy). The Interview Summary resulting from the interview correctly sets forth the substance of the interview. It is noted that claims 38-61 presented herein are in line with discussions held in the interview, inasmuch as added claims 38-61 recite methods and include surfactants

therein. Claims 38-61 have also been drafted based on the Examiner's comments in the interview, with a view to avoid all prior 35 USC 112, second paragraph issues.

Amendment Attachment

An attachment is enclosed with the present amendment, which contains therein the results of comparative testing experiments, with different surfactants (falling inside and outside of pending claims 38 and 50) in order to provide further evidence of the non-obviousness and patentability of the instant invention as recited in pending method claims 38-61. The Examiner is respectfully requested to give consideration to the enclosed attachment and the Experimental testing reported therein, and particularly Table 8 thereof, wherein the comparative test results are reported.

Should the Examiner desire and/or require that the "Amendment Attachment" be resubmitted at a future date in the form of a "*37 CFR 1.132 Declaration*", the applicants will endeavor to do the same.

In any event, however, it is submitted that the "Amendment Attachment" enclosed herewith provides probative evidence of the patentability of the claimed invention, so that a proper review and consideration of the same by the Examiner, at present, is respectfully requested.

Claim rejections 35 USC 112

Claims 8, 10, 11, 13, 23, 25, 28 (and those dependent thereon, i.e., claims 8-37) have been rejected under the provisions of 35 USC 112, second paragraph. Reconsideration and withdraw of this rejection is respectfully requested based on the following considerations.

First, each of the rejected claims has been cancelled herein, and newly added claims 38-61 do not contain objected to language in claims 8-37.

Second, claims 38-61 have been drafted based on comments made my the Examiner in the June 15th, 2004 interview to utilize terms relating to "cell count", which finds support in the instant application, for example, at pages 16, 17 and 34 of the specification, as well as other places.

Third, claims 38-61 as instantly drafted particularly and distinctly set for the inventive discovery that the applicants regard as their own, and the statue requires no more.

Claim Rejection Under 35 USC § 102(f)

Claims 8-10 and 23-25 have been rejected under 35 USC § 102(f), based on an allegation that the present inventors did not invent the subject matter of those composition claims. Reconsideration and withdraw of the rejection is requested based

on the fact that composition claims 8-10 and 23-25 have been cancelled from the application, and remaining claims 38-61 all relate to claimed methods of assisting the growth of plants, of which the present inventors are the original and true first inventors.

Claim Rejections Under 35 U.S.C. § 103

Claims 8-37 stood rejected under 35 U.S.C. § 103(a) as being unpatentable over any one of the following: Yamashita (US 5,549,729), Sampson (US 4,436,547) or Sakagami et al. (US 6,004,906). Reconsideration and withdraw of these prior rejections is respectfully requested based on the amendments made herein as well as the following considerations.

Obviousness Issues

To establish a *prima facie* case of obviousness of a claimed invention under 35 U.S.C. § 103(a), all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patenability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Distinctions Over the Cited Art

First, each of independent claims 38 and 50 recite a method for assisting the growth of a plant, which comprises the step of applying to the plant an effective amount of a plant-activating agent composition that comprises (a) a plant activation agent selected from a Markush grouping, and (b) a surfactant, which is also selected from a Markush grouping. It is submitted that such a method is nowhere taught or otherwise disclosed in any of the instantly cited art.

For example, none of the cited art references (i.e., Yamashita, Sampson, or Sakagami) teaches or otherwise provides for any method of assisting plant growth, which comprises a step were one applies to a plant a plant growth assisting composition that contains a two-component system as instantly claimed (i.e., a component (a) which is a plant activation agent selected from a Markush grouping, and a component (b) which is a surfactant, also selected from a Markush grouping).

Second, in each of claims 38 and 50, it is positively recited as follows.

> 38. A method for assisting the growth of a plant, comprising the step of:
> applying to the plant an effective amount of the plant-activating agent composition thereto, said plant-activating agent composition comprising...
> ... *wherein said agent shows not less than a 5% increase in unicellular green cell count within 15 days after an effective concentration of the plant activator has been given to a plant, wherein said increase in unicellular*

green cell count is calculated by the following formula:

Increase in unicellular green cell count (%)

= [(P_1-P_0)/P_0] x 100

wherein P_0 represents the count of unicellular green cells when the plant-activating agent is not used, and P_1 represents the count of unicellular green cells when the plant-activating agent is used; and

(b) a surfactant, *wherein said surfactant is at least one selected from an ester group-containing nonionic surfactant, an amphoteric surfactant, a carboxylic anionic surfactant, a phosphoric acid group-containing anonic surfactant and an ether group-containing nonionic surfactant having no nitrogen atom, wherein said ether group-containing nonionic surfactant is at least one selected from a polyoxyalkylene alkyl ether, an alkyl(poly)glycoside and a polyoxyalkylene alkyl(poly)glycoside. (Emphasis Added)*

50. A method for assisting the growth of a plant, comprising the step of:

applying to the plant an effective amount of the plant-activating agent composition thereto, said plant-activating agent composition comprising:

(a) a plant-activating agent selected from the group consisting of:

... wherein said agent shows not less than a 5% increase in green cell count of a callus of green cells within 15 days after an effective concentration of the plant activator has been given to a plant, wherein said increase in green cell count is calculated by the following formula:

Increase in green cell count of a callus of green cells (%)

= [(P_1-P_0)/P_0] x 100

wherein P_0 represents the count of green cells of a callus of green cells when the plant-activating agent is not used, and P_1 represents the count of green cells of a callus of green cells when the plant-activating agent is used; and

(b) a surfactant, *wherein said surfactant is at least one selected from an ester group-containing nonionic surfactant, an amphoteric surfactant, a carboxylic anionic surfactant, a phosphoric acid group-containing anonic surfactant and an ether group containing nonionic surfactant having no nitrogen atom, wherein said ether group-containing nonionic surfactant*

is at least one selected from a polyoxyalkylene alkyl ether, an alkyl(poly)glycoside and a polyoxyalkylene alkyl(poly)glycoside. (Emphasis Added)

It is submitted that none of the instantly cited references teach, disclose or render obvious the provision of a method for assisting the growth of a plant as recited in independent claims 38 and 50, wherein the plant activating agent possesses the properties recited in claims 38 and 50, with respect to an "*Increase in unicellular green cell count (%)*" (in claim 38), or "*Increase in green cell count of a callus of green cells (%)*" (in claim 50).

More precisely, neither Yamashita (US '729) nor Sampson (US '547) nor Sakagami et al. (US '906) teach or suggest the specific growth enhancing characteristics that are associated with the present invention, as are noted above and recited in each of independent claims 38 and 50.

Instead, the teachings and disclosures of each of the cited references primarily relate to large-type plants having higher-type plant cells (i.e., multicellular plant cells) and are not at all concerned with determining any cultivating effects on unicellular green cells, including chlorella (see claim 40), or calluses of green cells, including liverwort (see claim 52). Such limitations are however, positively recited in the present claims.

In support of the above contention, one need only look to

Sakagami US '906, Example 4 (column 6, lines 27-46), wherein mesophyll cells of asparagus are prepared, and to Example 1 (column 4, line 56 to column 5, line 45) wherein such cells are used in determining plant cell growth activity. Similarly, in Yamashita US '729 and Sampson US '547, all teachings appear to relate to testing possible agents for properties and effects that are different from and not recited in the methods of the present invention. For example, in Sampson US '547 its Experiments 1-5 utilize wheat, barley, rice, and wild oats, which are in no way to be deemed as "unicellular green cells" or "a callus of green cells," as is recited in the pending claims; and Yamashita US '729 at columns 42-45 recites in tabular form a plethora of large-type plants having multicellular cell structures, none of which large-type plants render obvious the above noted provisions relating an "*Increase in unicellular green cell count (%)*" (in claim 38), or "*Increase in green cell count of a callus of green cells (%)*" (in claim 50).

Third, in none of the cited art references is there ever provided for any motivation to utilize a surfactant as a component of a plant-activating agent composition, with the plant-activating agent composition being applied to a plant as a step in a method of assisting the growth of a plant, as is recited in the instant claims (see claims 38 and 50). Instead, it appears that the cited Yamashita US '729 reference only discloses the use of an

emulsifier for the purpose of a pest disruptant (see Example 6), and that Sampson US '547 only discloses the use of wetting agents as plant-growth regulators, as evidenced by Experiments 1-4 (reduction of stem height for plant), Experiments 5-7 (herbicide), Experiments 8-9 (fungicide), Experiment 10 (insecticide), and Experiment 11 (toxicity studies). Notably, in the cited Sakagami US '906 reference, there is not provided any disclosure relating to the use of a surfactant.

Fourth, even upon combining the separately cited references' disclosures, there is provided no teaching, disclosure or motivation to those of ordinary skill in the art that would cause or allow them to arrive at the present invention as claimed, including all its recited limitations.

Absent such motivation in the cited art to arrive at the instant invention as claimed, the USPTO's separate rejections under 35 USC § 103(a) over the Yamashita US '729 , Sampson US '547 and Sakagami et al. US '906 cannot be sustained. This conclusion does not change even if the teachings of such references are considered in combination, since even in combination their provided teachings do not lead those skilled in the art to arrive at the instant invention as claimed.

Therefore, based on the above considerations, it is submitted that the cited Yamashita, Sampson and Sakagami et al. references do not support a *prima facie* case of obviousness. This

ground of rejection has been obviated and thus, withdrawal of the outstanding 35 U.S.C. § 103 rejection is respectfully requested.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to contact John Bailey (Reg. No. 32,881) at the offices of Birch, Stewart, Kolasch & Birch, LLP.

Prompt and favorable consideration of this Response is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
John W. Bailey, #32,881

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

JWB/enm/kao/jwb
0425-0835P

AMENDMENT ATTACHMENT

Utilizing cultivation conditions and methods disclosed in the instant specification (e.g., see pages 16-19, 34, 37-39 and 46) the following experiments were carried out in order to further evidence the patentability of the instant invention. The comparative test results of the Experiments are shown in Table 8, below.

Experiment 6

Using cultivation conditions and method for the standard improved degree in reproduction of chlorella disclosed in the specification, there was measured the improved degree in reproduction of green cells at 8^{th} day (after 192 hours) after starting the cultivation. However, concentrations of substances added to the culturing solution in the test area are shown in Table 8. The results are shown in Table 8. The results in Table 8 are relative values when the value in the control area is made as 100.

Experiment 7 <Measurement of SPAD value etc.>

(7-1 Test Plant)

Species: tomato "Momotato"

Vessel for cultivation:

a cell tray having 50 holes for germination,

a 15-cm (diameter) pot for cultivation.

Used soil: Kureha Engei Baido (supplied by Kureha Chemical Industry Co., Ltd.) [the fertilizer components: N:P:K=0.4:1.9:0.6 (g/soil 1 kg)]

(7-2 Cultivation condition and Measurement)

Using cultivation conditions described in the specification, in a glass greenhouse at the temperature of 25°C under natural light with carbon dioxide and humidity under natural conditions, seeds were sown into a cell tray having 50 holes. Two weeks after germination, seedlings thereof were transplanted to the pot. With the plant-activating agent-mixed solution comprising the plant-activating agent as shown in Table 8 and a 3000-fold diluted solution of "Otsuka OKF2" (supplied by Otsuka Chemical K.K.) as a fertilizer component, the soil was treated seven times in total every week from seven days after the transplantation. Concentrations of the plant-activating agent in the mixed solutions are shown in Table 8. The balance therein is water. The soil was permeated with the treated amount of about 50 ml per one pot. Third day after completion of the 7^{th} treatment, the SPAD value, the improved degree of leaf-area, the increased amount in concentration of ascorbic acid in the blade part and the decreased degree in concentration of nitrate ion in the blade part were measured by the above-mentioned methods. For both of the test area and control area, plural individuals were prepared and three individuals selected arbitrarily were used for the measurement.

The results are shown in Table 8, and the SPAD value is an average value obtained respectively for the 3 individuals by 20-times measurements (data number: 60), and other values are an average value of the 3 individuals (data number: 3). Besides, for 3 individuals other than these, 3^{rd} day after completion of the 7^{th} treatment, the increased amount in plant-weight (dry weight) was measured by the above-mentioned method. The

results are also shown in Table 8. In Table 8, the values except the SPAD value are relative values as compared with that in the control area.

Experiment 8

100 ml of the medium (MSK2 medium) for liverworts were placed into a 500-ml Erlenmeyer flask, and the flask was capped with a silicon cap having its ventilative property and placed into an autoclave (at a high temperature, under a high pressure, and a sterilized oven) to sterilize the medium (for 20 minutes). Herein, the substance acting as the plant-activating agent was added in a concentration shown in Table 8 into a culturing solution in the test area. After sterilization, the temperature of the medium was returned to a normal temperature. 2 ml of liverwort callus cells under a steady state, which had been sub-cultivated previously, were sucked up by a 2-ml Komagome pipette (measuring pipet) and incubated to the sterilized medium. These operations are conducted in a clean bench when sterilized condition is necessary. Cultivation is carried out in a shaking incubator rotating at 110 rpm at 23 °C under continuous illumination (with illuminance of 10 klx.) with carbon dioxide and humidity under natural conditions. Tenth day (after 240 hours) after starting the cultivation, the whole culturing solution in each area was filtrated under suction, and the fresh weight (raw weight) (g) of the callus cell was measured. This was made as the amount in reproduction of green cells, and the improved degree in reproduction of green cells was measured by the above-described formula. The results are shown in Table 8. The results in Table 8 are relative values when that in the control area is made as 100.

Table 8

			Experiment 6	Experiment 8	Experiment 7				
	(a)plant-activating agent (10ppm)	(b) surfactant (50ppm)	Increase in cell count of chlorella (%)	Increase in cell count of liverwort callus (%)	SPAD value (point)	Dry weight of plant (%)	Leaf-area (%)	Concentration of ascorbic acid in the blade part (%)	Concentration of nitrate ion in the blade part (%)
Inventive product	diacyl glycerol(Acyl=C18:1)	POE(20) alkyl(poly)glucoside (alkyl=C18)	150	145	39.2	119	110	117	89
	diacyl glycerol(Acyl=C18:1)	alkyl(poly)glucoside (alkyl=C12,C14)	155	147	39.5	120	110	118	89
	diacyl glycerol(Acyl=C18:1)	POE(20) stearyl ether	145	144	39.3	118	110	115	89
	diacyl glycerol(Acyl=C18:1)	POE(20) sorbitan monooleate	160	149	40.0	128	113	121	85
	diacyl glycerol(Acyl=C18:1)	stearyl betaine (stearyl dimethyl amino acetate)	149	145	40.4	122	112	119	88
	diacyl glycerol(Acyl=C18:1)	oleate potassium soap	150	141	39.5	120	111	118	88
	diacyl glycerol(Acyl=C18:1)	Alkylphosphate(alkyl=C12)	151	144	39.0	125	120	120	86
	stearyl cetyl ether	POE(20) sorbitan monooleate	155	142	38.9	120	118	120	86
	stearyl trimethylammonium chloride	POE(20) sorbitan monooleate	141	138	38.4	117	115	116	91
	ornithine	POE(20) sorbitan monooleate	150	141	39.5	119	117	119	89
	glutathione	POE(20) sorbitan monooleate	165	145	39.5	122	120	122	86
	deoxyribonucleic acids	POE(20) sorbitan monooleate	155	146	39.0	123	120	123	85
	hinokitiol	POE(20) sorbitan monooleate	162	150	40.2	130	125	125	84
	glycerol fermentation product	POE(20) sorbitan monooleate	164	149	41.1	129	126	125	83
	vitamin A	POE(20) sorbitan monooleate	173	151	39.3	132	127	126	82
control	Only the culturing solution or fertilizer components		100	100	35.0	100	100	100	100
comparative product	diacyl glycerol(Acyl=C18:1)	Octoxynol-9(Octylphenylether(EO9))*	95	90	34.3	98	95	97	103
	diacyl glycerol(Acyl=C18:1)	Alkylaryl polyether ethanol**	98	89	34.1	96	93	96	104
	diacyl glycerol(Acyl=C18:1)	POE(3)nonylphenyl ether	89	84	35.2	93	90	93	105
	stearyl cetyl ether	Octoxynol-9(Octylphenylether(EO9))*	93	86	34.5	90	91	93	105
	stearyl trimethylammonium chloride	Octoxynol-9(Octylphenylether(EO9))*	77	72	32.3	83	70	81	118
	ornithine	Octoxynol-9(Octylphenylether(EO9))*	96	94	35.5	96	96	96	108
	glutathione	Octoxynol-9(Octylphenylether(EO9))*	103	103	35.8	103	101	99	105
	deoxyribonucleic acids	Octoxynol-9(Octylphenylether(EO9))*	102	103	36.0	105	102	101	100
	hinokitiol	Octoxynol-9(Octylphenylether(EO9))*	103	103	36.1	106	103	102	100
	glycerol fermentation product	Octoxynol-9(Octylphenylether(EO9))*	104	103	36.5	106	103	103	100
	vitamin A	Octoxynol-9(Octylphenylether(EO9))*	103	104	36.2	106	103	103	100

*:TritonX-100 **:TritonX-363M